

## **Part 2. Improve laboratory-based surveillance for emerging foodborne pathogens**

### **A. PulseNet**

**Objective 1:** Continue to perform PulseNet activities.

**Measures of Effectiveness:**

- *E.coli* O157:H7 and *L. monocytogenes* are tested by PFGE and uploaded within 96 hours.
- All other isolates submitted for PFGE testing are tested and uploaded within 2 weeks of receipt.
- Communicate cluster and outbreak information to epidemiologists in a timely manner.
- Lab staff score >85% in annual competency exams specific for the PFGE Laboratory.
- The annual PulseNet meeting is attended by one PulseNet laboratorian

**Progress:**

Between 9/1/06 and 8/1/07, 88% of *E.coli* O157:H7 isolates and 30% of *L. monocytogenes* were tested by PFGE and uploaded within 96 hours. Several isolates had longer turnaround times due to failed runs. The lab responded by modifying existing protocols, in consultation with CDC, to prevent similar occurrences in the future.

- All other isolates submitted for PFGE were tested and uploaded within 2 weeks of receipt.
- All clusters were communicated verbally and by email to the Epidemiology Program within 24 hours of identification. Fifteen clusters were posted to the PulseNet Webboard between 9/1/06 and 8/1/07, all of which were posted on the day the cluster was identified.
- The PFGE lab participated in annual PulseNet proficiency testing, with a score of 98% for *E. coli* O157:H7, 95% for Salmonella, 92% for Shigella, and 100% for *Listeria monocytogenes*.
- The 2007 Annual PulseNet Update Meeting was attended by T. Stiles. R. Serrell and P. Kludt were also able to attend portions of the conference.

### **Special Instructions: Progress Report: Pulsenet**

1. List all laboratory staff, percentage of time and hours spent solely on PFGE. Highlight any new staff added in the last year and add the date they started.

PulseNet Personnel	New/Continuing	If New, Start Date	% Time on PFGE/PFGE Analysis (est.)
Tracy Stiles	Continuing		50%
Janet Sennott	Continuing		100%
Matt Gianferante	Continuing		100%
Kara Watarida	Continuing		75%
Rebecca Serrell	New	8/1/2006	100%

2. List total number of PFGE gels run in your laboratory in the last year (from July 1, 2006 – June 30, 2007), regardless of organism (QA/QC gels should be included). **506**

3. Complete the following table:

**PulseNet General Statistics  
For 12-Month period (from July 1, 2006 – June 30, 2007\*)**

	Total # of isolates received during past 12 months*	Total # of isolates run by PFGE during past 12 months*	How many isolates were run with primary enzyme?	How many isolates were run with secondary enzyme?
<i>E. coli</i>	143	110	110	110
<i>Listeria</i>	30	48	48	48
<i>Shigella</i>	173	150	150	150
<i>Salmonella</i>	1698	1276	1276	318
<i>Campylobacter</i>	403	0	0	0

### PulseNet Area Laboratories

**Objective 1:** To continue to perform the expanded responsibilities of a PulseNet Area Lab.

*Measures of Effectiveness:*

- High-priority isolates received from northeastern state labs are analyzed within 3 business days.
- $\geq 75\%$  of low-priority isolates from northeastern state labs are analyzed within 5 business days.
- Requests for training are met within one month from receipt of request.
- Requests for technical assistance are responded to within 24 hours of receipt of request.
- The annual PulseNet meeting is attended.

**Progress:**

Between 9/1/2006 and 8/1/2007, 29 high-priority isolates were received from RI and NJ. Because of technical difficulties with Listeria gels failing in late 2006, 48% of Listeria isolates were not resulted within 5 days. A new procedure has been adopted with CDC guidance, including preparation of new media with better stability.

- No low-priority isolates from northeastern state labs were received.
- No requests for training were received from region laboratories.
- Requests for technical assistance were responded to within 24 hours of receipt of request.

- The annual PulseNet meeting was attended.
- MA began the process of completing a certification set for MLVA of *E. coli*.

Special Instructions: Progress Report: PulseNet Area Lab

**PulseNet Area Lab General Statistics  
For 12-Month period (from July 1, 2006 – June 30, 2007\*)**

<b>Area Lab Responsibility</b>	<b>Area Lab Notes</b>
<b>Training of personnel in area labs:</b> include number of people trained, dates, subject matter	none
<b>Travel to labs within area:</b> travel for training, troubleshooting, etc.	none
<b>Troubleshooting support for labs within area:</b> list phone calls/visits related to troubleshooting support	MA routinely runs all isolates of <i>L. monocytogenes</i> received in NJ. In portions of 2006-2007 we routinely ran and uploaded isolates of <i>Listeria monocytogenes</i> from RI. In addition, in 2007 we received tif images from RI for the purpose of troubleshooting.
<b>Surge Capacity:</b> list number of isolates rec'd from each state for PFGE; include supplies sent to states	none
<b>Evaluations for CDC:</b> list any lab or software methods your lab helped evaluate	MA participated in external validations of (1) changes in plug making procedures (eliminating SDS from plug agar, optimizing the density of the cell suspension used to make the plugs), (2) the BioPlex method for Salmonella serotyping, and (3) MLVA typing of <i>Salmonella typhimurium</i> . MA is currently completing the certification set for <i>E. coli</i> by MLVA.
<b>Communication with labs in area:</b> include all phone calls, emails, etc. and list dates of contact	MA held conference calls with all states in the northeast region on 7/27/07 and 5/30/07. Routine E-mails are sent to remind labs in this region we are available for support (troubleshooting and surge capacity testing). A Northeast Regional PulseNet meeting is being planned for Boston in 11/2007. This has involved 5 conference calls.
<b>Regional Meetings:</b> list the date of any regional meetings within time period*	

### C. Telediagnosis and Molecular Diagnosis of Parasitic Diseases through DPDx

**Objective 1:** Test for *C. parvum*, *C. cayetanensis*, and *G. lamblia* and participate in teledagnosis.

*Measures of Effectiveness:*

- All necessary supplies and reagents are purchased to maintain capacity for testing.
- Routine quality control procedures are followed to maintain capacity for testing.
- Staff achieves at least 85% on annual proficiency panel and exam.
- One additional staff member is trained in parasitology methods.

**Progress:**

- Between 9/1/07 and 8/1/07, all necessary supplies and reagents were purchased to maintain capacity for testing and routine quality control procedures were followed.
- Staff achieved 100% on annual proficiency panel and exam.
- One additional staff member, L. Cavalieri, was trained in parasitology methods.

Special Instructions: Progress Report: DPDx and implementation of molecular diagnosis of parasitic diseases:

1. List equipment purchased (telediagnosis and molecular diagnostic equipment): **None**
2. List software purchased: **None**
3. Specify if funds were used to implement telediagnosis in remote labs. If they were, describe in detail the activities developed in the sites equipped using the telediagnosis equipment, e.g., type of activities such as training and how many telediagnosis consultations were addressed. **N/A**
4. Describe any training activities developed with the use of telediagnostic approaches. **None**
5. Describe any diagnostic parasitology training needs addressed with the funds granted: **One additional staff member, L. Cavalieri, was trained in parasitology methods.**
6. List how many telediagnosis consultations were made (inquiries sent to CDC or other reference laboratories; inquiries received from regional labs):  
Describe how many cases were successfully addressed and how many needed a follow up or confirmatory diagnosis, e.g., PCR. Include and specify telediagnosis inquiries received by consulting labs as well. **One consultation was made and was successfully addressed.**
7. List how many PCR tests were performed on parasites using protocols transferred by CDC (including those performed for test validations). **None**
8. List the specific PCR-based tests that are being validated or are already in use for the diagnosis of parasitic diseases. **None**
9. List how many cases/samples required the use of PCR-based tests for confirmatory diagnosis. **None**

**D. Capacity for molecular identification of foodborne viruses**

**Objective 1:** Continue providing norovirus testing in support of outbreak investigations, and complete validation of RTD-PCR norovirus assay.

*Measures of Effectiveness:*

- Specimens are tested by RT-PCR method and submitted to CDC in a timely manner.
- A real-time PCR method is validated on the Bio-Rad iCycler.

**Progress:**

- Between 9/1/2006 and 8/1/2007, 89 specimens were tested for norovirus by RT-PCR. Specimens were tested within 5 days of receipt. One specimen was submitted to CDC. No other specimens were requested by CDC.

- MA has been working on familiarization and optimization of a real-time PCR assay using the Applied Biosystems 7500 platform and will begin validation of this procedure by year's end.

Special Instructions: Progress Report – Molecular Diagnosis of Foodborne Viruses

1. List equipment purchased: **none**
2. List software purchased: **none**
3. Specify if funds were used to implement molecular diagnostic techniques in remote laboratories. **No funds were used.**
4. Describe any training needs addressed or training activities developed with funds received. **Between 9/1/2006 and 8/1/2007, 2 existing laboratory staff were trained for norovirus testing.**
5. Specify whether the laboratory has validated the diagnostic procedure under CDC guidance. **MA validated norovirus testing using conventional RT-PCR methods under CDC guidance in the past. Validation of the RTD-PCR assay will occur this year, with CDC guidance.**
6. Estimate how many specimens were tested or how many PCR reactions were performed for confirmatory diagnosis. **Between 9/1/06 and 8/1/07, 100 specimens were received for norovirus testing. Of these, 29 were positive for norovirus, 60 were negative for norovirus, and 11 were not tested because they were not outbreak related or were not properly submitted.**
7. Estimate a goal for next FY regarding the use of molecular techniques. Include estimate of how many specimens may be processed and tested if possible. **Two laboratorians will validate a real time RT-PCR method for norovirus using CDC protocols. Between 1/1/08 and 12/31/08, we anticipate that up to 150 specimens will be processed and tested for norovirus by PCR.**
8. Participate in sharing sequence data against CaliciNET database. **We plan to share sequence data by CaliciNET when we are able to perform sequencing for norovirus RNA.**

## E. NARMS

**Objective 1:** Identify and ship every 20<sup>th</sup> isolate of *Salmonella* species, *Shigella* species, and *E. coli* O157:H7, and every isolate of *S. typhi*, *Listeria*, and *Vibrio* non-cholera to NARMS.

*Measures of Effectiveness:*

- All 2007 isolates that meet the specified criteria are correctly identified and submitted.

**Progress:**

Since 08/01/2006, a total of 58 isolates have been submitted, including 30 *Salmonella* sp., 8 *Shigella* sp., 2 *E. coli*, 12 *Salmonella typhi*, and 2 non-cholera *Vibrio* species. All 58 isolates were typed by PFGE; these results were submitted to the National PulseNet program and to NARMS.

**Objective 2:** Participate in other NARMS activities such as conference calls and submission of additional isolates requested by NARMS.

*Measures of Effectiveness:*

- All 2007 calls are attended by appropriate laboratory and epidemiology staff.
- All additional isolates requested by NARMS are submitted to NARMS.

**Progress:**

- T. Stiles, R. Goldbaum and J. Fontana attended 3 of 3 conference calls in 2006.
- No additional isolates were requested by NARMS.

**Objective 3:** Participate in the NARMS *Salmonella* serotyping QA/QC Program

*Measures of Effectiveness:*

- The *Salmonella* QA/QC panel is serotyped and results reported to NARMS.
- Discrepant results are investigated and corrective actions documented.

**Progress:**

- The Enteric Lab participated in the *Salmonella* serotyping QC/QC program offered by NARMS, successfully serotyping 10 of 10 isolates in the panel of unknowns.
- There were no discrepant results.
- Susceptibility testing using the NARMS panel was not requested in 2006.